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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BEKELE, MEKONEN T	
ART UNIT	PAPER NUMBER
2624	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/517,922	KALKER ET AL.	
	Examiner	Art Unit	
	MEKONEN BEKELE	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 October 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-7,9-10,12-20* is/are pending in the application.

4a) Of the above claim(s) *12-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-7,9 and 10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1, 3-7, 9 and 10 are pending in this application.

2. Claims 2, 8 and 11 are cancelled.

3. Claims 12-20 are withdraw.

Priority

4. Applicants' claim for foreign priority under 35U.S.C 119(e) is acknowledge based on the foreign application PCT/IB03/02569 filed on 06/17/2002.The certified copy has been filed in parent application No. 10517922, filed 12/14/2004

Drawings

5. The Drawings filed on 12/14/2004 are accepted for examination.

Response to Amendment

6. Applicants' response to the last Office Action, filed, on June 2, 2008 has been entered and made of record.

7. The rejection of claims 2, 8 and 11 are rendered moot by applicant's cancellation of those claims.

8. Applicants argued that Federica does not teach or suggest **using the restoration data accommodated in a segment for reconstructing a previous segment of the host signal.** The applicant argument is persuasive. However, the well established and widely used Interleaving technique can be applied to accommodate in segment the restoration data for a previous segment. Therefore, applicants' amendment

has required new grounds of rejection. New grounds rejection are therefore presented in the Office Action

Claim Rejections - 35 USC § 103

The following is a quotation of the 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained thought the invention is not identically disclosed or described as set forth in section 102 of this title, if the difference between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. *Claims 1,3-4 and 6 are rejected under 35 U.S.C 103(a) as being unpatentable over Brain Chen (hereafter Chen). "Design and Analysis of Digital Watermarking Information Embedding, and Data Hiding System", Ph. D Thesis, Massachusetts Institute of Technology, June 2000, in view of Acharya et al.(hereafter Acharya), "Compact Storage of Medical Images With Patient Information", IEEE Trans. Inf. Technol. Biomed., vol. 5, pp. 320-323, Dec. 2001.*

As to claims 1 and 6, Chen teaches A method (**page 29-32, embedding methods and System**) of embedding auxiliary data (**Abstract: embedding information some times called watermark**) in a host signal (**Abstract**), the method comprising:

using a predetermined data embedding method **(Abstract: quantization index modulation embedding method and the LBM modulation embedding method, see thesis summary page 20 section 1.2**) having a given embedding rate (**page 24. section 2.1 lines 6- 8, embed at of rate of Rm bits per hot signal, the embedding**

rate corresponds to embedding rate Rm) and distortion **(page 24. section 2.1 lines 19-22: see equation 2.2)** to produce a composite signal **(page 23 Fig. 2.1 see composite signal S)**;

using a portion of said embedding rate (**page 20 section 1.2 lines 6-7, the LBM modulation embedding system has two steps: the first step extracting the least significant bit(s),LSB, from the host signal and compress, and the second step is embed the massage into the compressed part of the host signal, thus the portion of the embedding rate corresponds to the embedding rate used during the extraction and compressing process)** to accommodate restoration data (**page 20 section 1.2 lines 6-7, extracting the LSB from the host signal and compress it in order to embed the message signal in to the host signal, restoration data corresponds to the compressed data)** identifying the host signal conditioned **(section 1.2 lines 6-7 and lines 16-18, identifying distortion of the host signal caused by the extraction and compression process)** on said composite signal;

using the remaining embedding rate using the remaining embedding rate for embedding said auxiliary data **(page 20 section 1.2, the LBM modulation embedding system has two steps as mentioned above, where the second step is embed the massage into the compressed part of the host signal, thus the remaining embedding rate corresponds to the embedding rate used during the embedding process of a message in to the compressed part of the host signal)**;

dividing the host signal **(page.58 section 5.1 line10)** into successive segments **(page.58 section 5.1 lines 9-12**, successive segments **corresponds to non-overlapping blocks of length L)**

applying the predetermined data embedding method to said segments **(page 59. section 5.1, Fig. 5-1)**

However it is noted that Chan doesn't specifically teaches "accommodating in a segment the restoration data for a previous segment" although one can apply well established Interleaving technique to accommodate in segment the restoration data for a previous segment;

On the other hand the technique of in interleaving an image with a data file in a digital watermarking environment of *Acharya* specifically teaches accommodating in a segment the restoration data for a previous segment (**Abstract, page 321 left col.2nd equation 4, and right col. section II, *Acharya specifically* teaches one sample of encrypted heart-rate signal is interleaved into one pixel in case of ADM, while in DPCM, four pixels are required to interleave one encrypted sample. The DPCM is a widely used predictive coding technique, where in the present sample x_n in a signal is expressed as a sum of linearly weighted past sample x_{n-1} and error signal e_n :**

$$x_n = x_{n-1} + e_n$$

accommodating in a segment the restoration data for a previous segment **corresponds to the equation** $x_n = x_{n-1} + e_n$ **)**

It would have been obvious to one of ordinary skill in the art at the time of invention was made to incorporate the interleaving technique to embed patient information into medical images of *Acharya into the design and analysis of digital watermarking Information embedding, and data hiding system of Chen, because that would have allowed user of Chen to* accommodating in a segment the host signal for

previous segment using the widely used predictive coding (DPCM) or the adaptive delta Modulation (ADM)technique of *Acharya*.

It would have been obvious to one of ordinary skill in the art at the time of invention was made to incorporate the interleaving technique of *Acharya into the design and analysis of digital watermarking Information embedding, and data hiding system of Chen, because Acharya teaches* how the digital watermarking technique is adapted for interleaving patient information such as text documents and physiological signals with medical to reduce storage and transmission overheads.

As to claim 3, *Acharya* teaches each segment comprises the restoration data for said previous segment as well as auxiliary data (**page 321 left col.2nd equation 4, and right col. Section II,** the restoration data **corresponds to the LSB of the image pixel**, auxiliary data **corresponds to the error signal e_n**).

As to claim 4, *Acharya* teaches accommodating auxiliary data only in a segment of a given length **(page 321 left col.2nd equation 4, and right col. section II, the error signal e_n is just 1 bit in length and is interleaved with the LSB of the image pixel**);

a). accommodating, in a subsequent segment, restoration data only for the previous segment**(page 321 left col. 2nd paragraph, the DPCM is a widely used predictive coding technique, where in the present sample x_n in a signal is expressed as a sum of linearly weighted past sample x_{n-1} and error signal e_n :**

$$x_n = x_{n-1} + e_n$$

accommodating in a segment the restoration data for a previous segment **corresponds to the equation** $x_n = x_{n-1} + e_n$ **)**

b) adapting the length of said subsequent segment to the amount of restoration data being embedded therein**(page 321 right paragraph, see equation 5 and 6,** at the nth sample instant, the step length generated is related to the step length of the previous sampling instant

$$S(n) = S(n-1)e_n + S_0 e_{n-1}$$

This step length is used to estimate the present sample signal $\hat{x}(n)$ **as follows:**

$$\hat{x}(n) = \hat{x}(n-1) + S(n)\,);$$

c). repeating steps (b) and (c) a predetermined number of times**(page 321 right paragraph, using regressive equations (4) or (5)).**

10. Claims 7,9 and 10 are rejected under 35 U.S.C 103(a) as being unpatentable over Fredrich et al. (hereafter Fredrich), US Patent No. 7,006,656 B2 filed on Oct. 15, 2001, in view of Acharya et al.(hereafter Acharya), "Compact Storage of Medical Images With Patient Information", IEEE Trans. Inf. Technol. Biomed., vol. 5, pp. 320-323, Dec. 2001.

As to claims 7 and 10, Fridrich teaches A method of reconstructing a host signal (**Fig.1 Extraction section, abstract, co1.13 lines13-35, step 1-5, a method of data extraction and recovery of the original image,** reconstructing a host signal **corresponds to recovery of the original image**) from a composite signal (**Stego image)** representing a distorted version of said host signal (**Fig.1 : Embedding part, the extracted and compressed part of the image which is the output of the Compress RS-vector)** with data embedded therein (**Fig.1 : Embedding part, with the message bits embedded by means of Flip Groups block)**, the method comprising:

retrieving the embedded data **(Fig. 1 Extraction part, col. 13 lines 25-30 step 4, the Extract Groups block extract the compressed bit stream from Stego Image,**

embedded data **corresponds to the compressed bit stream which is the out put of Extract Groups block)** from the composite signal **(Stego Image)**;

splitting the embedded data into restoration data and auxiliary data(**Fig. 1: Extraction section, col. 13 lines 30-35 step 5, the Decompress RS-vector block split the compressed bit stream into a Message bits and LSB of the host signal, auxiliary data corresponds to the a Message bits, restoration data corresponds to LSB of the host signal),**the restoration data identifying distorted symbols in the distorted version of the host signal **(Fig. 1 section 2 ,the input of the Uniflip Groups block content the distortion version of host signal);**

reconstructing the host signal using the restoration data, given the composite signal (**Fig.1 section 2, col. 13 lines 13-35; step1- step 5, follow step1 through step 5 to reconstruct the original image from the Stego Image);**

dividing the composite signal into successive segments **(co1.13 lines 14-15, see step 1);**

However it is noted that Fridrich doesn't specifically teach using the restoration data accommodated in a segment for reconstructing a previous segment of the host signal, although one can apply well established Interleaving technique to accommodate in segment to reconstruct a previous segment of the host signal

On the other hand the technique of in interleaving an image with a data file in a digital watermarking environment of *Acharya* specifically teaches the restoration data accommodated in a segment for reconstructing a previous segment of the host signal,

(**Fig. 4, Abstract, page 321 left col.2nd equation 4, and right col. section II, *Acharya specifically* teaches one sample of encrypted heart-rate signal is interleaved into one pixel in case of ADM, while in DPCM, four pixels are required to interleave one encrypted sample. The DPCM is a widely used predictive coding technique, where in the present sample x_n in a signal is expressed as a sum of linearly weighted past sample x_{n-1} and error signal e_n :**

$$x_n = x_{n-1} + e_n$$

accommodating in a segment the restoration data for a previous segment **corresponds to the equation** $x_n = x_{n-1} + e_n$ **. The original heart- rate signal, reconstructed signal and the error signal are shown in Fig 4(a) to 4(c)).**

As to claim 9, *Acharya* teaches each segment of the composite signal comprises the restoration data for said previous segment as well as auxiliary data (**page 321 left col.2nd equation 4, and right col. Section II**, the restoration data **corresponds to the LSB of the image pixel**, auxiliary data **corresponds to the error signal e_n**).

11. *Claim 5 is rejected under 35 U.S.C 103(a) as being unpatentable over Brain Chen (hereafter Chen). "Design and Analysis of Digital Watermarking Information Embedding, and Data Hiding System", Ph. D Thesis, Massachusetts Institute of Technology, June 2000, in view of Acharya et al.(hereafter Acharya), "Compact Storage of Medical Images With Patient Information", IEEE Trans. Inf. Technol. Biomed., vol. 5, pp. 320-323, Dec. 2001, farther in view of Fredrich et al. (hereafter Fredrich), US Patent No. 7,006,656 B2 filed on Oct. 15, 200.*

It is noted that both Chen and *Acharya do not teach* repeating steps (b) and (c) until the length of the subsequent segment is smaller than a predetermined threshold, although *Acharya teaches accommodating* in a segment the restoration data for a previous as discussed above;

On the other hand Fredric teaches said step (d) comprises repeating steps (b) and (c) until the length of the segment is smaller than a predetermined threshold (**co1.13 lines 1-2, repeat step 4 until the difference length of the compressed bit stream C and the number of processed coefficients K larger than the message M to be embedded, thus the compression and embedding process is continuo until C M+K, the predetermined threshold corresponds to M+K).**

It would have been obvious to one of ordinary skill in the art at the time of invention was made to incorporate the pseudo code for lossless data embedding in grayscale JPEG files of Fredrich into the combined method of Chen and Acharya, because that would have allowed user of Chen to apply different DCT coefficients for different JPEG quality factors to minimize the overall distortion and avoid introducing easily detectable artifacts **(Fredrich col. 12 lines31-40).**

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Mekonen Bekele whose telephone number is 571-270-3915. The examiner can normally be reached on Monday -Friday from 8:00AM to 5:50 PM Eastern Time.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor AHMED SAMIR can be reached on (571)272-7413. The fax phone number for the organization where the application or proceeding is assigned is 571-237-8300. Information regarding the status of an application may be obtained from the patent Application Information Retrieval (PAIR) system. Status information for published application may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished application is available through Privet PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have question on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866.217-919 (tool-free)

/MEKONEN BEKELE/
Examiner, Art Unit 2624
January 6, 2009,

/Samir A. Ahmed/

Supervisory Patent Examiner, Art Unit 2624